

WHAT IS CLAIMED IS:

1. An apparatus for mixing an additive into a flowing fluid to form a settable mixture, comprising:

a main fluid passageway having an inlet for receiving a supply of the flowing fluid and an outlet for dispensing the fluid, said passageway having a longitudinal axis;

a control valve defining a portion of said main fluid passageway and configured for selectively controlling the flow of fluid in said passageway;

an additive injector disposed in said passageway between said inlet and said outlet, said injector having an emitter disposed in close relationship with said axis and oriented toward said outlet;

a static mixer disposed in said passageway between said injector and said outlet for enhancing the uniform mixing of the additive and the fluid;

connection points between said inlet, said valve and said static mixer being configured for smooth transition of fluid and the prevention of at least one of the collection and premature setting of the mixture.

2. The apparatus of claim 1 wherein said injector is provided in an injector housing which defines a portion of said main passageway.

3. The apparatus of claim 2 wherein said injector housing is connected to said valve at a first end and to said static mixer at a second end, transitions between said valve, said injector housing and said static mixer being smoothed to prevent collection of fluid and premature setting.

4. The apparatus of claim 1 wherein said valve is a pinch valve.

5. The apparatus of claim 1 wherein said injector includes a check for preventing the flow of fluid back into said emitter.

6. The apparatus of claim 5 wherein said check is an O-ring.

7. The apparatus of claim 1 wherein said injector is provided with a smooth shank and a head, said emitter being a bore disposed between said shank and said head.

8. The apparatus of claim 1 wherein said injector includes a check for preventing the flow of fluid back into said emitter, said check disposed to circumscribe said injector at said emitter.

9. The apparatus of claim 7 wherein said head is configured for promoting free flow of fluid thereover.

10. The apparatus of claim 7 wherein said head is tapered from a central peripheral edge to form a streamlined profile in said main passageway.

11. The apparatus of claim wherein said head is provided with a noncircular driving recess and said injector is provided with a threaded tip for securing said injector into said apparatus.

12. The apparatus of claim 1 further including a purge input for receiving at least one purging fluid.

13. The apparatus of claim 12 wherein said purge input includes both an air purge connection and a water purge connection in fluid communication with said main passageway.

14. The apparatus of claim 1 wherein said main passageway is defined by said control valve, an injector housing receiving said injector, said static mixer and connections between said valve, said housing and said mixer, said connections between said valve and said housing and between said housing and  
5 said mixer being configured for smooth transition of fluid and the prevention of at least one of the collection and premature setting of the mixture.

15. An apparatus for mixing an additive into a flowing, settable slurry, comprising:

a main slurry passageway having an inlet for receiving a supply of the slurry and an outlet for dispensing the slurry, said passageway having a  
5 longitudinal axis;

a control valve defining a portion of said main slurry passageway and configured for selectively controlling the flow of slurry in said passageway;

an additive injector disposed in said passageway between said inlet and said outlet, said injector having an emitter disposed in close relationship with  
10 said axis and oriented toward said outlet;

a static mixer disposed between said injector and said outlet for enhancing the uniform mixing of the additive and the slurry;

connection points between said inlet, said valve and said static mixer being configured for smooth transition of slurry and the prevention of collection of  
15 slurry and premature setting of slurry; and

said injector being configured for minimizing the collection of said slurry.

16. The apparatus of claim 15 wherein said injector is provided with a smooth shank and a head, said emitter being a bore disposed between said shank and said head.

17. The apparatus of claim 16 wherein said head is tapered from a central peripheral edge to form a streamlined profile in said main passageway.

18. The apparatus of claim 15 wherein said injector is positioned just upstream of said static mixer so that said additive is uniformly mixed with said slurry in said static mixer.

19. The apparatus of claim 15 wherein said static mixer has a reduced diameter nozzle which defines said outlet.

20. The apparatus of claim 15 further including a halo fitting, a passageway extension and a spray nozzle fitting connected to said passageway at an outlet end of said static mixer for spraying the slurry after passage through said static mixer.

21. A slurry spray applicator for spraying a settable slurry, comprising:

a main slurry passageway configured for receiving a supply of pressurized slurry and having a supply end and an outlet end opposite said supply end;

a first compressed gas inlet disposed intermediate said supply and outlet ends and in fluid communication with said slurry passageway for introducing a first supply of pressurized gas into the slurry, said inlet includes a fitting with a plurality of apertures connected to said slurry passageway for

10 introducing said first pressurized gas into said passageway in such a way as to atomize the slurry as it progresses toward said outlet end;

a second pressurized gas inlet disposed closer to said outlet end than said first inlet and disposed in relation to said slurry passageway for introducing a second supply of pressurized gas into the slurry without contacting said  
15 passageway;

a pressurized supply of adjuvant in fluid communication with said second pressurized gas inlet for providing a blended gas to said second gas inlet;

valve means for controlling the flow of slurry through said passageway and the flow of said first and second gases into said slurry  
20 passageway;

said applicator being constructed and arranged so that prior to the pressurized ejection of the slurry from said outlet end, said first gas is injected into the slurry, and said blended gas is subsequently mixed with the combined slurry and said first pressurized gas.

22. The applicator of claim 21 wherein said fitting is a halo fitting.